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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,155	10/16/2003	Horst Flock	HOE-784	7869
20028	7590	07/13/2004	EXAMINER MILLER, PATRICK L	
LAW OFFICE OF BARRY R LIPSITZ 755 MAIN STREET MONROE, CT 06468			ART UNIT 2837	PAPER NUMBER

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/687,155	Applicant(s) FLOCK, HORST	
	Examiner Patrick Miller	Art Unit 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-17 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02272004</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Priority

1. The Examiner notes that the application data sheet recites the requisite claim of priority for this application as a continuation of PCT/EP02/04171.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.
 - The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.
 - The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

3. Claims 1-17 are objected to because of the following informalities: See bullets below.

Appropriate correction is required.

- Claim 1 recites, "in particular for operating electric motors." Delete "in particular."
- Claim 1 (line 8) recites, "a single signal output." It is unclear whether this signal is the same as the "one signal output" cited earlier (line 7). Please clarify.
- Claim 1 (line 10) recites, "that is to say." Examiner suggests changing this to "wherein the switching signal pairings are defined as" or similar.
- Claims 2, 12, and 13 recite, "in such a way that." Replace with "so that" or similar.
- Claim 3 recites, "the feed voltage." Lack of antecedent basis for this term.

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- Claim 6 recites, “a not freely programmable stage.” This feature is already cited in claim 4. Please clarify.
- Claim 9 recites, “the inputs of the complementary stage.” Lack of antecedent basis for this term. Delete “the.”
- Claim 11 recites, “the feed voltage.” Lack of antecedent basis for this term. Change “the” to “a.”
- Claim 12 recites, “the ‘tristate’ signal.” Lack of antecedent basis for this term. Change “the” to “a.”
- Claim 12 recites, “the ‘high’ and ‘low’ signal states.” Lack of antecedent basis for this term. Change “the” to “a.”
- Claim 13 recites, “a potential.” It is unclear whether this potential is the same as that cited in claim 12. If so, change “a” to “the,” if not please distinguish.
- Claim 14 recites, “the freewheeling state.” Lack of antecedent basis for this term. Change “the” to “a.”
- Claim 15 (line 4 of claim) recites, “a phase tap.” It is unclear whether this phase tap is the same as the “phase taps” recited in the first line of the claim. Please clarify.
- Claim 15 (line 9 of claim) recites, “a single signal.” It is unclear whether this signal is the same as the “at least one signal output” cited in line 8 of the claim. Please clarify.
- Claim 15 recites “all the control circuits.” This claim only recites a single control circuit.” Please clarify.
- Claim 15 recites, “a common processor.” It is unclear whether this “common processor” is the same as the processor recited earlier in the claim. Please clarify.

- Claim 15 recites, “the latter of a common processor.” It is unclear what “the latter” means. Please delete this wording.
- Claim 17 recites, “ a pulse-width modulated manner.” It is unclear whether this is the same as “pulse-width modulation operation.” Please clarify.
- Claim 17 recites, “a corresponding second electronic switch.” Change “a” to “the.”

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 3, 13, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
- Claim 3 recites, “the latter.” It is unclear what this means. Please clarify.
 - Claim 14 recites, “if this is required on account of the inductance of the load and the switching off of the first electronic switch.” It is unclear what condition “triggers” the freewheeling state. Please clarify.
 - With respect to claim 13, it is unclear what further limitation this claim provides. Please clarify.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 12, 13, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Genova et al (6,534,937).

- With respect to claims 1 and 15, Genova et al disclose a controller for a half-bridge, the half-bridge comprising: a first electronic switch between a supply voltage and a phase tap (fig. 1, Dm1), and a second electronic switch between the phase tap and ground (fig. 1, Dm2); the controller having a control circuit, which controls the two electronic switches (fig. 1, #13); a common processor that controls the control circuit with at least one signal output (fig. 1, #12; logic processes, therefore it is classified as a processor); the control circuit controls both of the electronic switches based on the at least one signal output (fig. 1, #13 controls switches based on signal “INA” output from #12); and the control circuit producing only three switching circuit pairings for the two electronic switches, where the switches are controlled with only one of the three switching circuit pairings at a time, and wherein the switching circuit pairings are the following: first switch on, second switch off; first switch off and second switch on; and both switches off (cols. ½, lines 60-67/1-9).

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- With respect to claim 2, the processor controls the switches so they are “high,” “low,” or “tristate” configuration, wherein the “tristate” configuration is interpreted to be floating, or the potential can set itself freely (cols. ½, lines 60-67/1-9).
- With respect to claims 12 and 13, the “tristate” signal state automatically sets a potential that lies between the “high” and “low” states (see voltage for “Vb,” where this would also apply to “Va”).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1-7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapman (6,232,731) in view of Genova et al (6,534,937).

- With respect to claims 1 and 15, Chapman disclose a controller for a half-bridge, the half-bridge comprising: a first electronic switch between a supply voltage and a phase tap (fig. 1, #5), and a second electronic switch between the phase tap and ground (fig. 1, #8); the controller having a control circuit, which controls the two electronic switches (fig. 1, #11); controlling the controller with at least one signal output (fig. 1, “Motor Command”); the control circuit controls both of the electronic switches based on the at least one signal output (fig. 1, #11 controls #5 and #8 based on the “Motor Command” signal); and the control circuit producing only three switching circuit pairings for the two electronic switches, where the switches are controlled with only one of the three

switching circuit pairings at a time, and wherein the switching circuit pairings are the following: first switch on, second switch off; first switch off and second switch on; and both switches off (col. 3, Table in lines 50-58; see switch numbers 5 and 8).

- Chapman discloses a single motor command signal sent to the control circuit (); however, Chapman does not explicitly disclose this signal being sent by a processor.
- Genova et al disclose a processor that supplies a signal to a control circuit for a half-bridge (fig. 1, #12; logic processes signals, therefore it is classified as a processor). The motivation to control the control circuit with a single signal sent from a processor is to control the logic states of the switches. This provides the advantage of operating the switching devices in the “correct” state during motor operation, which increases motor efficiency and output (col. 1, lines 52-59).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that the “Motor Command” signal of Chapman could be sent by a processor, thereby providing the advantage of increasing motor efficiency and output, as taught by Genova et al.
- With respect to claims 2 and 3, Chapman discloses “high,” “low,” and “tristate” signals, wherein the states are defined as the feed voltage, ground, or a free potential setting (col. 3, Table in lines 50-58; see switch numbers 5 and 8, where both switches in the OFF state represents the “tristate,” and the “tristate” is interpreted to be “floating,” i.e., the potential is free; additionally, when #5 is on, output is at V+, when #8 is on, output is ground, and when both #5 and #8 are off, the voltage is floating).

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- With respect to claims 4-7, Chapman discloses the control circuit comprises a not freely programmable stage, wherein the stage is hard-wired, with hard-wired components, the control circuit establishes fixed associations between the switching pairings and switching states (col. 3, lines 59-62).
7. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genova et al and Chapman in view of Genova et al as applied to claim 1 above, and further in view of Hardt (6,611,117).
- Genova et al and Chapman in view of Genova et al do not disclose the control circuit having two complementary stages.
 - Hardt disclose a control circuit that has two complementary stages, and the inputs to the complementary stages are connected to the signal output via resistors of equal size (fig. 2, outputs, #30 and #40 to BJT transistors). The motivation to use a complementary stage as described above, is to provide the advantage of implementing a pre-driver stage (cols. 5/6, lines 64-67/1-5).
 - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to add two complementary stages as described above, to the circuit of Genova et al and Chapman in view of Genova et al, thereby providing the advantage of implementing a pre-driver stage, as taught by Hardt.

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8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Genova et al and Chapman in view of Genova et al as applied to claim 1 above, and further in view of Palara et al (EPO 0373693 A2).

- Genova et al and Chapman in view of Genova et al do not disclose the control circuit comprising a driver circuit for each of the electronic switches.
- Palara et al disclose a driver circuit for each of the electronic switches (fig. 1, #8 and #9). The motivation to use a driver circuit for each of the electronic switches is to provide the advantage of providing more “space” of the overall control circuit design for adding another driver circuit in the event that one of the driver circuits malfunctions and needs to be replaced. More specifically, contrast when a single driver circuit that supplies signals to two switches malfunctions with when an individual driver circuit malfunctions. Replacing the circuitry of a single driver circuit would take up more space on the circuit board or in programmable memory, whereas replacing only an individual driver circuit would use less space or memory.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to replace the single driver circuit that supplies both driving signals in the control circuit of Genova et al and Chapman in view of Genova et al with a driver circuit for each electronic switch, thereby providing the advantage of using less circuit board space or programmable memory in the long run, should a driver circuit malfunction and need to be replaced, as taught by Palara et al.

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9. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genova et al (6,534,937) as applied to claim 15 above.

- With respect to claim 16, Genova et al does not explicitly disclose the half-bridges controlled by pulse-width modulation; however, referring to Figure 4A, it would have been obvious to one having ordinary skill in the art at the time of the invention that to achieve the outputs of Vb and Vc, the switching devices would be controlled using pulse width modulation. Pulse-width modulation provides the advantage of increasing motor efficiency, when compared to a constant supply of voltage.
- With respect to claim 17, Genova et al disclose one of the half-bridges operated in a pulse-width modulated manner and a corresponding second electronic switch of another half-bridge constantly turned on (fig. 4A, Va is constantly turned on and Vb and Vc are operated by pulse-width modulation).

Allowable Subject Matter

10. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- With respect to claim 11, the Prior Art does not disclose the control circuit turning the first switch off and the second switch to on when the voltage at the processor breaks down.

Prior Art

11. The Prior Art of record but not relied upon:

- Itoh et al (5,335,029) disclose a processor that sends a single signal to a control circuit for a half-bridge (fig. 1, output of #100 to #104).
- Röttger (4,901,366) discloses a system that uses a driver circuit for each switching device.

Conclusion

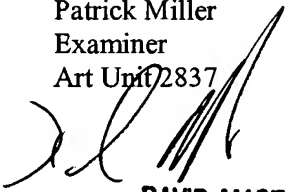
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 571-272-2070. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2800 ext 41. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

pm
July 10, 2004

Patrick Miller
Examiner
Art Unit 2837

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